TM014

Claims

1-24 Canceled

25. (New) A device for object recognition, the device comprising:

a signal source (10), adapted to generate at least one electromagnetic wave (12) which may be reflected by an object;

a receiver (14) for receiving the at least one electromagnetic wave (18) reflected by the object (16); and

an evaluation unit, wherein the evaluation unit is provided to evaluate a polarization of the at least one electromagnetic wave (18) reflected by the object(16) and received by the receiver (14) and to generate at least one evaluation signal (22).

26. (New) A device according to claim 25, wherein the evaluation unit (20) is adapted to determine a rotation angle of the polarization between the at least one electromagnetic wave (18), reflected by the object (16) and received by the receiver (14) and an electromagnetic wave emitted by the signal source.

27. (New) A device according to claim 25, wherein the evaluation unit (20) is adapted to determine a type of polarization of the at least one electromagnetic wave (18) reflected by the object (16) and received by the receiver (14).

28. (New) A device according to claim 25, wherein the evaluation unit (20) is adapted to determine a wavelength of the at least one electromagnetic wave (18) reflected by the object (16) and received by the receiver (14).

29. (New) A device according to claim 25, wherein the signal source (10) is adapted to change at least one of an angle of polarization, a level of polarization and a type of

polarization of the generated at least one electromagnetic wave (12), in order to generate at least two differently polarized electromagnetic waves (12).

30. (New) A device according to claim 25, wherein the signal source (10) is adapted to change the wavelength of the generated at least one electromagnetic wave (12), in particular to generate at least two electromagnetic waves (12) with different wavelengths.

31. (New) A device according to claim 30, wherein the evaluation unit (20) is adapted to determine on a basis of the evaluated polarization, to evaluate the properties of polarization of at least two electromagnetic waves with different wavelengths, to evaluate the ratio of the two electromagnetic waves.

32. (New) A device according to claim 31, wherein the device is provided in a safety system of vehicle, and the evaluation unit (20) is adapted to generate as an evaluation signal (22) an information signal for controlling a passenger protection system (24, 26, 28, 30) on a basis of information on a determined surface of the object.

33. (New) A device according to claim 32, wherein a control unit (24) of the passenger protection system includes a comparison unit (25), which compares the evaluation signal (22) with a threshold value (27), the control unit (24) being adapted to trigger at least one safety device (26, 28, 30) when the evaluation signal (22) exceeds the threshold value (27).

34. (New) A device according to claim 33, wherein the control unit (24) of the passenger protection system is adapted to change the threshold value (27)

dependent on the evaluation signal (22).

35. (New) A device according to claim 25, wherein the device is used in a pre-crash-system, a cV-system, an ADC-system a warning system for obstacle and/or slippery ice and/or a recognition system for roadway conditions.

36. (New) A device according to claim 25, wherein the receiver (14) is adapted to change its receiving characteristics controlled by the evaluation unit (20).

37. (New) A device according to claim 25, wherein the signal source (10) is adapted to generate at least one linear, circular or elliptically polarized electromagnetic wave, having a wavelength in the region of visible light.

38. (New) A method of object recognition comprising:

generating and emitting at least one electromagnetic wave, wherein the at least one electromagnetic wave may be reflected by an object;

receiving at least one electromagnetic wave reflected by the object;

evaluating a polarization of the received electromagnetic wave; and

generating an evaluation signal based on the evaluation of the received electromagnetic wave.

39. (New) A method according to claim 38, wherein a rotation angle of the polarization between the at least one electromagnetic wave (18), reflected by the object (16) and received and emitted, is determined.

40. (New) A method according to claim 38, wherein a type of polarization of the at least

one electromagnetic wave (18), reflected by the obstacle (16) and received, is determined.

41. (New) A method according to claim 38, wherein a wavelength of the at least one electromagnetic wave (18), reflected by the object (16) and received, is determined.

42. (New) A method according to claim 38, wherein at least one of an angle of polarization, a level of polarization and a type of polarization of the generated at least one electromagnetic wave (12) is changed, wherein two or more electromagnetic waves (12) having polarizations different from each other are emitted.

43. (New) A method according to claim 38, wherein a wavelength of the generated at least one electromagnetic wave (12) is changed, wherein two or more electromagnetic waves (12) having wavelengths different from each other are emitted.

44. (New) A method according to claim 38, wherein on the basis of the evaluated polarization a surface structure of the object is determined.

45. (New) A method according to claim 44, wherein the method is used in a vehicle passenger protection system and on the basis of information on the determined surface structure the passenger protection system (24, 26, 28, 30) is controlled.

46. (New) A method according to claim 38, wherein at least one of emitting characteristics when emitting and receiving characteristics when receiving the at least one electromagnetic wave (18) reflected by the object (16) is changed.

47. (New) A method according to claim 38, wherein at least one linear, circular or elliptically polarized electromagnetic wave, having a wavelength in the region of visible light, is generated.

48. (New) A method according to claim 38, wherein a non-polarized electromagnetic wave is emitted and its reflection at the object is analyzed with regard to properties of polarization portions and directions contained in the reflected wave, and information thus obtained is compared with stored information on polarizations of reflected waves at certain materials.